

Claims

1. A method of real-time simulation, the method comprising:
 - providing a continuous real-time clock to a non real-time simulator;
 - synchronizing a simulation clock of the non real-time simulator with the continuous real-time clock on a continuous basis; and
 - advancing the non real-time simulator to a first time based on the simulation clock reaching the first time.
2. The method according to claim 1, further comprising:
 - advancing the non real-time simulator to a second time based on the simulation clock reaching the second time.
3. The method according to claim 1, further comprising:
 - receiving an event for the non real-time simulator at a second time on the continuous real time clock; and
 - advancing the non real-time simulator to a time on the simulation clock equivalent to the second time on the continuous real time clock.
4. The method according to claim 3, further comprising:
 - submitting the event to the non real-time simulator for simulation at the time on the simulation clock.
5. The method according to claim 4, further comprising:
 - instantiating a call-back function for the event.

6. The method according to claim 5, further comprising:
initiating the call-back function in response to the event satisfying a predefined role in the non real-time simulator.

7. An apparatus for real-time simulation, the apparatus comprising:
a non-real time simulator; and
a controller module configured to interface with the non real-time simulator and provide real-time simulation, wherein the controller module is further configured to provide a continuous real time clock to the non real-time simulator to drive a simulation clock of the non real-time simulator and to advance the non real-time simulator to a first time on the simulation clock based on the continuous real time clock reaching the first time.

8. The apparatus according to claim 7, wherein the controller module is further configured to advance the non real-time simulator to a second time on the simulation clock based on the continuous real time clock reaching the second time.

9. The apparatus according to claim 7, wherein the controller module is further configured to receive an event for the non real-time simulator at an event time on the continuous real-time clock.

10. The apparatus according to claim 9, wherein the controller module is further configured to map the event time to a simulation event time and to advance the non real-time simulator to the simulation event time.

11. The apparatus according to claim 10, wherein the controller module is further configured to forward the event to the non real-time simulator.

12. The apparatus according to claim 7, further comprising:
a configuration entity configured to provide configuration to the controller module.

13. The apparatus according to claim 12, wherein the configuration entity is a scenario generator.

14. The apparatus according to claim 7, further comprising:
a messaging entity configured to provide messages for simulation to the controller module.

15. The apparatus according to claim 14, wherein the messaging entity is a radio emulator.

16. The apparatus according to claim 7, wherein the controller module further comprises:
a real-time controller loop configured to the non real-time simulator;
a traffic output module adapted to accept output messages from the non-real-time simulator;
a traffic input module adapted to receive input messages from a messaging entity;
and
a packet queue configured to buffer input and output messages.

17. A computer readable storage medium on which is embedded one or more computer programs, the one or more computer programs implementing a method of real-time simulation, the one or more computer programs comprising a set of instructions for:

- providing a continuous real-time clock to a non real-time simulator;
- synchronizing a simulation clock of the non real-time simulator with the continuous real-time clock on a continuous basis; and
- advancing the non real-time simulator to a first time based on the simulation clock reaching the first time.

18. The set of instructions according to claim 17, further comprising:

- advancing the non real-time simulator to a second time based on the simulation clock reaching the second time.

19. The set of instructions according to claim 17, further comprising:

- receiving an event for the non real-time simulator at a second time on the continuous real time clock; and
- advancing the non real-time simulator to a time on the simulation clock equivalent to the second time on the continuous real time clock.

20. The set of instructions according to claim 19, further comprising:

- submitting the event to the non real-time simulator for simulation at the time on the simulation clock.

21. The set of instructions according to claim 20, further comprising:

- instantiating a call-back function for the event.

22. The set of instructions according to claim 21, further comprising::
initiating the call-back function in response to the event satisfying a predefined
role in the non real-time simulator.